Elm Creek News

NEWS LETTER NO. 12.
MAY, 1935

PROJECT Nº4
TEMPLE, TEXAS

(4100 Copies of this Issue)

TO OUR COOPERATORS

The name of the Soil Erosion Service has been officially changed to Soil Conservation Service. This information was received in a memorandum from H.H. Bennett, Chief, Soil Conservation Service, Washington, D. C.

There is still a limited amount of Sudan grass seed available for planting to temporary pastures. Application for this seed should be made at the Soil Conservation office.

Until further notified by the Soil Conservation office, equipment will be furnished to cooperators only for completion work on outlet ditches, terraces, terrace fills, and fills around the structure wingwalls.

To carry on a successful erosion control program on any farm, completion and completion alone is the only solution.

The recent rains have brought out very clearly the need and importance of having all outlet ditches thoroughly completed as to depth and width. Before a ditch can carry the capacity for which it was designed it must be cut out to grade between each structure. Therefore we suggest that all outlet ditches be plowed from the bottom of the upper spillway to top of the lower spillway after each rain. The width to which a ditch should be plowed depends entirely upon the width of the notch in the structure.

As you know all of the outlet ditches are designed to have a flat bottom and the sooner this stage is reached the sooner you will have the desired protection.

All cooperators who have completed terraces recently and desire red top cane seed or Hegari seed for planting on the terraces or for strip cropping should make application for seed at the Soil Conservation office.

The Soil Conservation Service is pleased with the response of cooperators in mowing pastures for weed control. At present we only have three mowing machines. This being the case it would be advisable for some of the cooperators to use other machines which may be in their community. We are moving the machines that we have as fast as possible, but with the tremendous amount of mowing to be done it can easily be seen that three mowing machines can not do what should be done.

Mowing of weeds means preventing them from making seeds.

We know of no better method of storing a part of your feed crop than to place it in a properly constructed trench silo.

Start making your plans now for feed storage.

The next issue of this publication will carry information on the construction and filling of the trench silo.

SOIL LOSSES AT THE SOIL EROSION STATION TEMPLE, TEXAS.

The Soil Erosion Station, located just south of Temple, Bell County, Texas, serves approximately 11,000,000 acres in the Blackland Prairie Region. The eastern part of the Grand Prairie, lying to the west, has soil and climatic conditions somewhat similar to those prevailing in the Blackland Prairie, so that approximately 15,000,000 acres may be considered as being served by the Temple Soil Erosion Station. The predominant soils are Houston clay and Houston black clay. Cultivation of the fertile black prairie soils started some fifty to sixty years ago. Since that time the common practice has been to run rows of cultivated crops up and down slopes, and the results have been disastrous. The top soil has been eroded to such an extent that crop yields have been declining steadily from year to year. A chart, compiled at Texas Substation No. 5, indicates that cotton yields, in nine Blackland counties, gradually declined from approximately 200 pounds per acre in 1905 to 135 pounds per acre in 1926. The problem becomes acute when it is realized that once the fertile black top-soil is gone it is most difficult and, in many places, it is virtually impossible to renew soil fertility on severely eroded fields in the Blackland.

The work being conducted by the Temple Soil Erosion Station not only indicates that severe soil losses are being incurred but it also offers several methods of soil erosion control. The figures cited are for four years ending with 1934. During this period, where corn rows were up and down a four per cent slope, the average yearly soil losses (dry weight) have ranged from over 30,000 pounds (15.33 tons) per acre to over 39,000 pounds (19.60 tons) per acre. On these same areas, from 11.05 per cent to 14.28 per cent of the total rainfall has been lost as runoff. Each 100 gallons of this runoff has carried 36.75 pounds to 39.18 pounds of soil (dry weight). In contrast to this heavy soil loss, three areas on a four per cent slope, which have had a rotation of corn, oats, and cotton, rows up and down the slope, have incurred far more moderate average annual soil losses, ranging from 5.47 tons per acre, to 10.1 tons per acre. In like manner, the per cent of runoff was reduced, ranging from 5.93 per cent to 7.98 per cent. Undoubtedly, the crop of oats, in the rotation, was very effective in reducing the average annual soil losses. This is borne out by the fact that when oats occupied the land, the soil losses have never been as much as one ton per acre, per year.

Some of our very gently sloping lands are generally considered to be reasonably free of any serious degree of soil erosion. In 1934, however, where cotton and corn rows were up and down two per cent slopes, soil losses (dry weight) ranged from over 12,000 pounds (6.17 tons) per acre to nearly 25,000 pounds, (12.42 tons) per acre. Land of this type is often referred to as "level" land but it is evident that protection against soil erosion is needed.

The year 1934 will always be regarded as having been a dry year, Nevertheless, two storm periods, one in April and one in November, were the cause of severe soil erosion. On one area, of four to six per cent slope, where cotton rows were up and down the slope, the 1934 soil loss was 29.84 tons (dry soil) per acre, and 15.06 per cent of the rainfall was lost as runoff. The actual amount of sludge or mud washed from this piece of ground was 96,904 pounds or 48.45 tons per acre. This condition presents a fair picture of what occurred to most of the unprotected cultivated lands in the Blackland in 1934. In contrast to this record, a field having the same slope and type of soil, and strip-cropped to oats and cotton, lost only 9.6 tons of soil per acre in 1934; this represented less than one-third as much soil erosion as where cotton rows were up and down the slope. It should be noted that this good showing was made under very unfavorable conditions; due to a very dry fall, it was not possible to plant oats until November 5, and during the month of November, over eight inches of rainfall was incurred at a time when the oats crop was barely established. In 1933, this same strip-cropping field went into operation with the rain of July 30 (4.99 inches) and from this time until the end of the year, the soil loss was only .41 ton per acre. For the Texas Blackland Region, winter oats are considered to be one of the most effective erosion-control crops because of the fact that the land is protected during the greater part of the year and especially during the periods when most of the rainfall is normally incurred.

Under ordinary field conditions, where land is not terraced and there are noticeable depressions or "washes", the planting of cultivated crops on contour is not a good practice. A field planted to cotton in this manner, incurred a soil loss of 31.26 tons (dry weight) per acre, in 1934. A much better procedure is contour farming in conjunction with the plan of maintaining a vegetative cover in all drainage-ways or "washes".

At this time, the figures relating to operation of terraces are not available, but it is planned to issue this information when the data is compiled and assembled.

VISITORS

Large groups from the following communities in Texas visited this project during the month of April: Sherman, Granger, Cameron (two groups from College Station), and Houston. The staff also had the pleasure of conducting the Presidents of the 12 Federal Land Banks and members of their staffs over the project.

Since January 1st this project has had visitors from the following states and foreign countries: Oklahoma, Nebraska, District of Columbia, Louisiana, New York, Connecticut, Massachusetts, Maryland, Kentucky, Missouri, Minnesota, Kansas, California, Mississippi, Arizona, South Africa, India, and England.

Some of the staff will be available to conduct tours over the project at any time and we cordially invite any one interested in erosion control work to visit the Elm Creek project.

WORK COMPLETED DURING APRIL, 1935.

1. 6.6 miles of terrace lines were run.
2. 110.8 miles of terraces were constructed.
3. 241 mechanical (concrete) terrace outlets completed.
4. 202 terrace outlets were protected with vegetation.
5. 5 mechanical (sack and cement) gully control structures were completed.
6. 465 spreaders for sodded terrace outlets and outlet ditches were completed.
7. 11,572 acres were mapped showing soil types, degree of erosion and slope of the land.
8. 12 educational lectures were given.
9. 5,000 bulletins and pamphlets were issued.
10. 67 acres of cultivated land were retired and planted to permanent pasture.
11. 6 acres of pasture land were contour furrowed.
12. A decrease of 1,423 acres of clean-tilled crops was made.

WORK COMPLETED TO APRIL 30, 1935.

1. 2,437.9 miles of terrace lines have been run.
2. 1,308.6 miles of terraces have been constructed.
3. 2,938 mechanical (concrete) terrace outlets have been completed.
4. 2,746 terrace outlets have been protected with vegetation.
5. 20 mechanical (sack and cement) gully control structures have been constructed.
6. 1,271 spreaders for sodded terrace outlets and outlet ditches have been completed.
7. 118,827 acres have been mapped, showing soil types, degree of erosion and slope of the land.
8. 54,900 bulletins and pamphlets have been issued.
9. 935 acres have been removed from cultivation and planted to permanent pasture.
10. 894 acres of pasture land have been contour furrowed.
11. A decrease of 3,541 acres has been made in clean-tilled crops.

LOSSES AT SOIL AND WATER LOSS DEMONSTRATIONAL PLOT NO. 3

The Soil Conservation Service, Elm Creek Project No. 4, Temple, Texas, wishes to call to your special attention data on the soil loss demonstrational plot. This plot is located on the W. O. Johnson farm, two miles southeast of Moody, Texas.

On this plot a concrete catch basin has been constructed for the purpose of catching the soil and water washoff. The catch basin is 60'x20'x5' and has a series of multiple dividers in the overflow weir which lead to an aliquot tank where a representative sample of water is retained for a chemical analysis.

The eight acre plot, from which the soil and water losses are being measured, has no means or methods of erosion control. The system of rows used on this plot is the same as that practiced by the majority of farmers in the blackland region of Texas, that of running the rows up and down the slope.

In the following table you will find data on the soil and water losses to date.

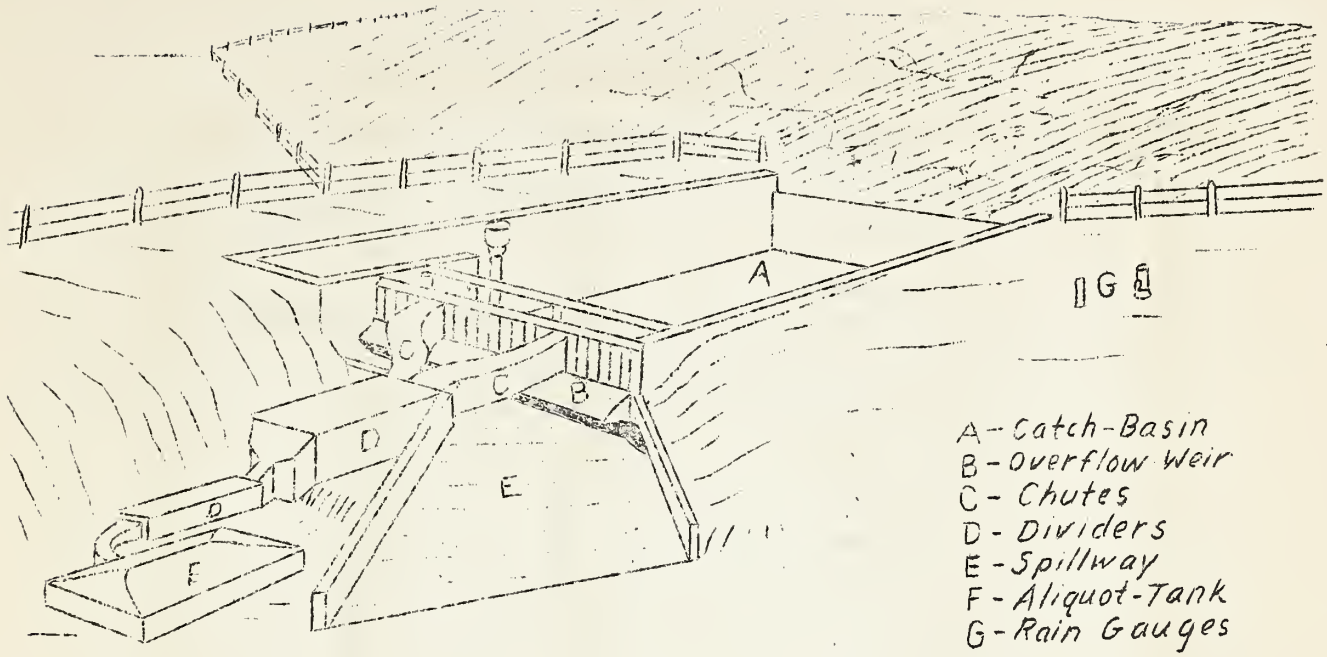
PLOT 3 -- 8 A. -1" rain - 217,232.0 gal.
1" Rain in tank - 760.3 gal.

Date of Rain	Amount of Rain	Lbs. wet wash in Silt Box	Lbs. Dry Wash per Plot*	Tons Wash Per plot Dry	Tons Wash Per Acre	Remarks
11-15-34	2.72"	39,942.4	22,263.9	11.13	1.37	Oats approx. 3" high
11-20-34	2.50"	74,333.2	42,786.2	21.39	2.64	"
4-25 to 30 1935	2.19	148,914.0	84,340.0	42.17	5.27	Aggregate of Nov. 19-20 rains. Corn had not been cultivated.
5-3 & 4, 1935	1.50	91,708.6	54,760.0	27.38	3.42	"
	8.91	354,898.2	Total to Date 204,150.1	102.07	12.7	

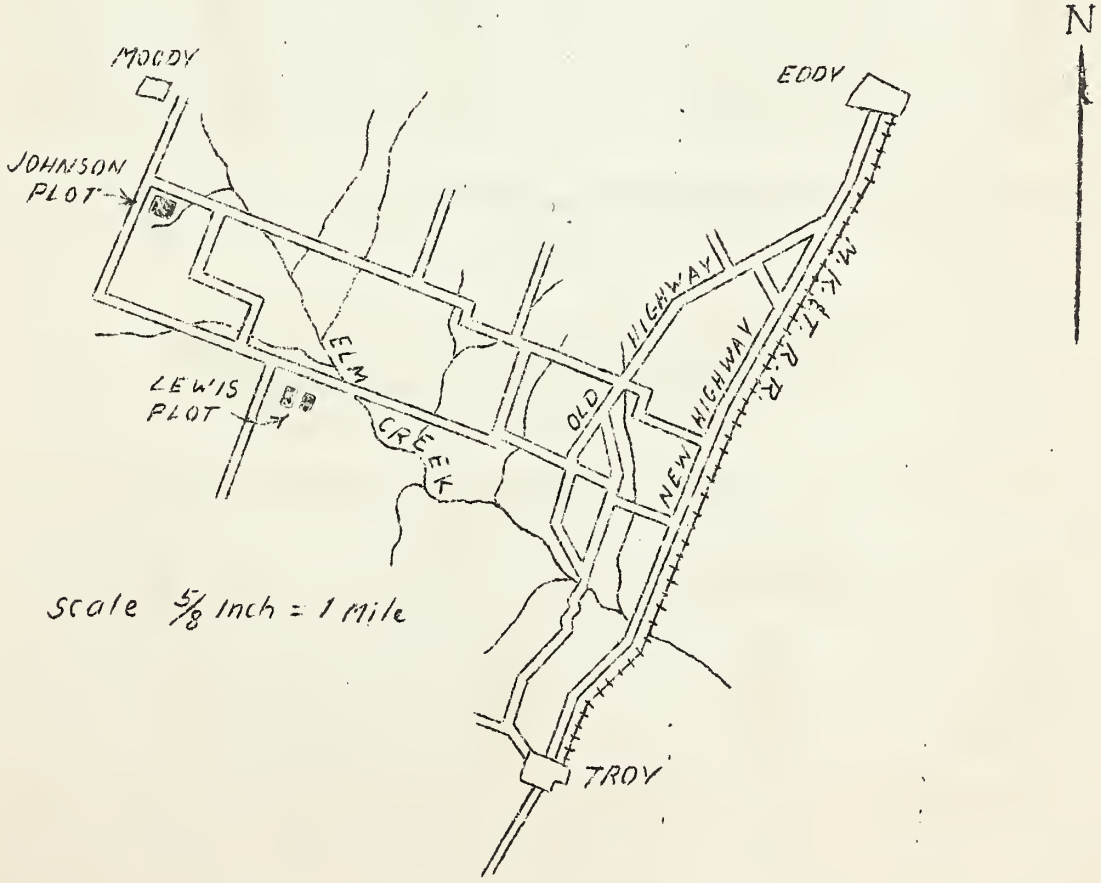
*Plus soil in suspension.

You will note some variations in the amount of soil loss in proportion to the amount of rain at different periods. This variation is largely due to the difference in intensity of the rain at different periods, the crop on the land, the state of cultivation, and the moisture content already in the soil from a previous rain.

A sketch of the Johnson plot and the location of the Lewis plots are shown on the opposite page. Farmers and others interested are invited to visit and examine these plots.



A - Catch-Basin
B - Overflow Weir
C - Chutes
D - Dividers
E - Spillway
F - Aliquot-Tank
G - Rain Gauges



MAP SHOWING LOCATION
OF JOHNSON AND LEWIS PLOTS

RAINFALL RECORD MARCH TO MAY INCLUSIVE

STA. NO.	AT OR NEAR	MARCH	APRIL	MAY
11	String	.91	1.06	7.90
12	Heidenheimer	.62	1.00	6.35
13	Oscar	.97	2.80	7.95
14	Double Header.	1.10	4.00	7.73
15	N.E. of Temple	No record	No record	8.14
16	Troy	1.12	2.86	8.84
17	Pendleton	1.00	2.90	No record
18	Moody	No record	3.07	4.94
19	Shiloh Church	1.25	2.77	8.32
20	Bottom Store	1.51	2.18	8.12
21	Oenaville	.36	3.78	7.09
22	Thoo Church	.70	2.85	7.11
23	Bean Hill	.99	1.24	7.22
24	Seaton	.85	2.75	8.27
25	Airville	1.16	1.38	4.28
26	Cyclone	.72	1.86	7.06
27	S. W. Meeks	No record	No record	8.15
40	Yarrellton	1.40	1.07	11.08
43	Barclay	.86	1.92	7.71
44	Terry Chapel	1.13	2.13	8.42
45	Burlington	1.36	2.72	10.28
46	S.E. Meeks	1.40	1.14	9.42
47	Westphalia	.92	1.92	7.78

NOTE: Rains for May include May 1-27 only.

****

EFFECT OF CROP ROTATION, RESULTS OF 14 YEARS

From Texas Agricultural Experiment Station
Substation No. 6, Denton, Texas

Crop	Yield: Non-rotated	Yield: Rotated with clover	Per cent increase
Wheat	10.5	22.8	117
Oats	38.6.	64.2	66
Corn	23.2	26.2	13
Cotton	194.5	237.2	22

Strip Cropping Proves Successful During Heavy Rains

From the standpoint of erosion control, the value of strip cropping can hardly be over-estimated. The heavy rains in this section of the state recently have helped to verify a number of statements previously made in connection with stripcropping alone, also stripcropping in connection with terracing.

In a number of instances, following the heavy rains, a large amount of silt has been caught where the washoff passed through a band of thick growing feed or grain crops. On the areas where terracing and stripcropping are being used in combination with each other less erosion has taken place than where terracing alone is being used.

On the R. L. Hartman farm, two miles north of Troy, on the Waco highway, a very good demonstration of stripcropping without terracing can be seen. Mr. Hartman made a statement to a group of farmers who were visiting the project a few days ago, that he had been trying to control erosion on his farm for a number of years. He stated further that he had even tried a form of strip-cropping and running his rows across the slopes before the Soil Conservation Service came to his aid. This all helped, but even then he had considerable soil and water losses. Mr. Hartman then said that since his lines had been properly located for the strips and run on the contour, giving exact spacing and areas for strips and for row crops, there had been neither soil nor water lost from his farm until the recent heavy rains, and even then very little washoff was evidenced. He concluded by saying if he lived on this farm for fifty years longer he would strip it every year.

Anyone wishing to see this splendid demonstration will find it very easy to locate on the Waco highway north of Troy about two miles.

****

Insects from Pastures and Weeded Areas May Damage Cotton Crop

The cotton flea hopper is considered by many in this locality to be the major cotton insect pest. At the present time it is building up an infestation on two common weeds in this section. These weeds are found in pastures, vacant lots, along the highway, field roads, turn rows, and ditch banks. By keeping these plants cut you will not only help to keep down an infestation of cotton flea hoppers that may later migrate to your cotton fields, but will also help to get rid of undesirable plants in your pastures. The names of these important cotton flea hopper host plants are the horsemint and the croton. If you are not familiar with them by these names some member of the Soil Conservation Service will gladly show them to you.

The cotton flea hopper is, as you most likely already know, a small insect about one-eighth inch long, pale greenish or grayish in color. If you will examine flowering plants of horsemint or croton weeds at the present time you will not have any trouble locating these insects that may at a later date migrate to your cotton fields and cause damage to the cotton plants by keeping them from fruiting normally.

RECONNAISSANCE EROSION SURVEY OF TEXAS, 1934
Summary of Erosion Conditions

Erosion Condition	Acres	Percent
Total area (exclusive of large cities and water)	169,326,465	100.0
Areas on which erosion conditions are not defined (A-W)	19,724,668	11.6
Areas with little or no erosion (1)	38,597,844	22.8
Total area affected by sheet erosion	92,430,413	54.6
One-fourth to three-fourths topsoil lost (2-27-28-24-247-248-25-257)	78,175,311	46.2
Over three-fourths topsoil and some subsoil lost (3-37-38-347-35-357)	14,255,102	8.4
Total area affected by wind erosion	21,405,624	12.6
Moderate wind erosion (4-24-248-347-247)	13,327,063	7.9
Severe wind erosion (5-25-35-257-357)	6,814,825	4.0
Destroyed by wind erosion (6-67-68)	1,263,736	0.7
Total area affected by gullying	78,027,402	46.1
Occasional gullies (17-27-37-247-347-257 357-67)	45,341,417	26.8
Severe gullying (18-28-38-68-248)	31,592,282	18.7
Destroyed by gullies (9)	1,093,703	0.6

SUMMARY OF EROSION CONDITIONS IN THE UNITED STATES, 1934

Erosion Condition	Acres	Percent
Total area (exclusive of large cities and water)	1,907,721,392	100.0
Areas on which erosion conditions were not defined. (This includes geologic erosion areas)	144,904,389	7.6
Areas with little or no erosion	578,167,570	30.3
Total area affected by sheet erosion	857,386,922	44.9
One-fourth to three-fourths topsoil lost	665,086,000	34.9
Over three-fourths topsoil and some subsoil	192,300,922	10.1
Total area affected by wind erosion	322,961,231	16.9
Moderate wind erosion	234,023,574	12.3
Severe wind erosion	79,735,880	4.2
Destroyed by wind erosion	9,201,777	0.5
Total area affected by gullying	866,821,976	45.4
Occasional gullies	524,792,576	27.5
Severe gullying	337,851,662	17.7
Destroyed by gullies	4,177,738	0.2

RECONNAISSANCE EROSION SURVEY DATA FOR TEXAS

The table on Page 9 gives the acreages of each erosion class found by the reconnaissance erosion survey. The first table gives a summary of erosion conditions.

The acreages represent areas in which the erosion condition as indicated was found to be the predominating condition, in all cases representing the condition on more than 25 percent of the land so included.

Erosion conditions are expressed by numerical symbols, with 1, 2 and 3 for sheet erosion; 4, 5, and 6 for wind erosion; and 7, 8, and 9 for gully erosion. To express the conditions which were found on any given area, these numerals were used in combination to express the condition of each of the classes found. Following are the individual symbols together with the description of each:

1. Little or no erosion. Less than 25 percent of the topsoil lost.
2. Moderate sheet erosion. Loss of 25 to 75 percent of the topsoil.
3. Sever sheet erosion. More than 75 percent of the topsoil lost. May include losses of subsoil, also.
4. Moderate wind erosion. Small amounts of surface soil removed, accompanied by local accumulations.
5. Severe wind erosion. Major amounts of surface soil removed. Usually accompanied by local destructive accumulations.
6. Extreme wind erosion. Soil losses and drifting too severe for cultivation.
7. Occasional gullies.
8. Frequent gullies.
9. Destroyed by gullying.

In the western states certain geological conditions were found on which specific erosion conditions could not be designated except in a generalized statement. These conditions were classes as follows:

A. Mesas, canyons, bad lands, rough mountain land.
R. Barren mountain tops. Areas above timber-line.
W. Scablands, shallow soils with frequent rock outcrop.

A combination of numerals was used to express the prevailing conditions on any given area. Thus 348 indicates that the area has been subjected to severe sheet erosion, to moderate wind erosion, and to frequent or severe gullying.

UNITED STATES
DEPARTMENT OF AGRICULTURE
SOIL EROSION SERVICE
OFFICE OF THE REGIONAL DIRECTOR
TEMPLE, TEXAS

OFFICIAL BUSINESS

1082

LIBRARIAN,
BUREAU OF AGRICULTURAL ECONOMICS,
U. S. DEPT. OF AGRICULTURE,
WASHINGTON, D. C.

SOIL EROSION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE
ELM CREEK WATERSHED--CENTRAL TEXAS
NEWS LETTER---------NO. 12
TEMPLE, TEXAS MAY ,1935